Zero Retries issue 0104 2023-06-23

Zero Retries is an independent newsletter promoting technological innovation in Amateur Radio, and Amateur Radio as (literally) a license to experiment with and learn about radio technology.

About Zero Retries

Steve Stroh N8GNJ, Editor

Jack Stroh, Late Night Assistant Editor Emeritus

In this issue:

- **Request To Send**
- **What Should Icom Do in the Near Future? (My Opinionated Opinions)**
- **Update on my Neil's Night Progress**
- **ZR > BEACON**
    - **Ofcom - Updating the amateur radio licensing framework - An approach for today and tomorrow's radio amateurs**
    - **Exploring the Experimental Firmware for Quansheng UV K5 Radio**
    - **uSDR - A tiny, single-sided M.2 SDR board that you can operate easily using your web browser**
- **Join the *Fun* on Amateur Radio**
- **Closing The Channel**

Web version of this issue - https://www.zeroretries.org/p/zero-retries-0104

Request To Send

Editorial by Steve Stroh N8GNJ

Our family's big event last weekend went well. There is one other big event coming up in a few months, but thankfully there is a lull in our lives allowing some catching up, including with some deferred work with Zero Retries, one of which (activating payments) you read about a few days ago.

It's a nice problem to have, but Summer 2023 will only allow brief periods of work in N8GNJ Labs, so I won't accomplish nearly as much as I'd hoped. But I will grind away at those personal projects, briefly reporting progress here in Zero Retries, and more substantive reporting of that progress at www.n8gnj.org.

Happy HAM RADIO this weekend in Friedrichshafen, Germany!

> HAM RADIO serves as a platform where radio enthusiasts can get together and exchange information and experience.
>
> As one of the largest amateur radio exhibitions in the world, alongside the Hamvention Dayton/Ohio, USA and the Ham Fair in Tokyo/Japan, HAM RADIO attracts exhibitors and visitors from more than 52 countries all round the world to Friedrichshafen.
>
> A special feature of HAM is the combination of commercial exhibitors, worldwide networked associations and Europe's largest radio flea market with over 300 participants from 16 countries.

I have not (yet) attended HAM RADIO, but I hope to do so in the next few years. I would enjoy learning more about vendors, products, projects and groups that are exclusive to Europe. My sense is that HAM RADIO is a bit "friendlier" to "projects" in its main exhibition area than Hamvention, and I especially look forward to seeing those projects. From those I have talked to who've attended HAM RADIO, it is a qualitatively different experience than Hamvention, which is its closest comparison.

Happy ARRL Field Day this weekend in the US!

> Field Day is ham radio's open house. Every June, more than 40,000 hams throughout North America set up temporary transmitting stations in public places to demonstrate ham radio's science, skill and service to our communities and our nation. It combines public service, emergency preparedness, community outreach, and technical skills all in a single event. Field Day has been an annual event since 1933, and remains the most popular event in ham radio.

Family circumstances don't permit me to be involved in ARRL Field Day this year, but I wish everyone well. In coming years, both for ARRL Field Day and Winter Field Day in January, I hope to have an integrated, portable HF station (a Go-Kit) that I can use easily in the field with and operate data modes (my personal preference) during Field Day and similar events.

***Starlink* Field Day?**

Now that I'm a Starlink customer, I consider communications with little terrestrial infrastructure required to be a mostly solved problem, especially when you factor in the increasingly capable battery plus solar units proving power. The combination of the Starlink hardware, battery plus solar, and Starlink

subscription isn't cheap… but it's amazingly capable… in fact, a paradigm change. But that's a story for a future issue of Zero Retries. *Teaser - Imagine an app that ran on a laptop or Raspberry Pi that connected to another (roaming) Starlink terminal (on battery power), transferred a large file, and then "logged the contact"?*

What Should Icom Do in the Near Future? (My Opinionated Opinions)

By Steve Stroh N8GNJ

As the title says… and I want to reiterate, this article is comprised entirely of my personal, individual, opinionated opinions only. Think of these opinions as entertainment value only. While some of these opinions might be seen as judgmental, they're not intended to be. I'm a fan of Icom! Not only are they the "home team" (US division is headquartered in nearby Kirkland, Washington) but Icom (generally) makes excellent Amateur Radio products. In addition to a long string of innovation in Amateur Radio, most recently Icom debuted the IC-905 VHF / UHF / Microwave "SuperRadio"1 and that is a highly significant accomplishment.

The referenced document is about "Whole of Icom", and the bigger picture of Icom as a business, especially the financial aspects, is out of scope for Zero Retries. Thus my opinions are only about Icom's Amateur Radio business and products and potential development of Amateur Radio business and products.

Disclaimer 1 - My knowledge of D-Star, and the various D-Star radios, and D-Star data modes is limited. I may well get details wrong in this article. I will be working on getting up to speed, especially on D-Star data this summer with a new (to me) Icom ID-880H and trying out data on that radio.

Disclaimer 2 - All of this is mostly about data modes in Icom's VHF and UHF radios. I don't consider myself qualified to offer opinions on Icom's (or any other manufacturer's2) High Frequency (HF) radios.

My thanks to Zero Retries Pseudostaffer Dan Romanchik KB6NU for this great Zero Retries Interesting heads-up - Report sheds some light on Icom's amateur radio strategy. KB6NU said, in part:

> Every once in a while, though, we get some tantalizing info out of manufacturers. I found an example of this in a recent post to the IC-7610 mailing list, "Interesting document on the Icom Japan website." The topic points to a document, "Medium Term Business Plan 2026," on the Icom Japan website. This report gives its fanboys (myself included) a little visibility into what's going on at Icom.

The first link is to The ICOM IC-7610 SDR TRANSCEIVER mailing list and it is closed (archives not viewable unless you are a member of the list, and membership requires applying to join). I don't need to be on yet another mailing list where I don't have a direct interest in the topic. Thus I have no insight into the discussion there.

The second link is to the Icom PDF document, and as KB6NU says, it's a good read. Here are some key points that stood out to me.

Slide 3 - Business Strategy, Strengthening our Core Business

- Development of new high frequency bands and new platforms
- Developing "Only Icom Can Do" products in the satellite radio field
- Deployment of different inter-protocol communication know-hot to other radio categories

Slide 18 - Strengthening Our Business Base: Core Business - Improved Performance and Functions of Products with New Platforms and Technologies

Amateur Radio

- Utilize technical know-how gained from digital technology and expand into other product categories
- Further improved usability and intuitive operation, expansion of requested/critical functions
- Restructuring of product lineup

Slide 19 - Strengthening Our Business Base: New Business - A Total Wireless Provider and Media Expansion

- New market development combining traditional RF technologies
    - Introduction of various hybrid radios and deployment of new protocols (Digitalization, etc.)

…

In my opinion, Icom has a number of unique competencies that it could leverage for accelerating its prospects for innovation in the Amateur Radio market in the near term (through 2026).

- A unique (as far as I'm aware) product called the IC-SAT100 which is a "works anywhere in the world when you can see the sky" portable radio that operates via the Iridium satellite system. There are many other Iridium portable devices, but none (again, that I'm aware of) that operate like a classic two-way portable radio.
- Icom pioneered high speed data in a production Amateur Radio product in the Icom ID-1 voice / data radio and the Icom "Digital Data" (DD) mode. The ID-1 and DD implemented a 128 kbps data mode that used a 100 kHz channel in the Amateur Radio 1240 - 1300 MHz band3. Notably, Icom also offers a DD repeater. While the ID-1 has been discontinued, DD has been implemented in new products such as the ID-RP1200VD repeater, the IC-9700 VHF / UHF radio, and recently the IC-905 VHF / UHF / Microwave radio.
- Icom also pioneered low speed data as a supported capability of its D-Star digital voice radios, including D-Star repeaters4. During transmission, ~ 950 bps is available for "streaming" data - anything transmitted to the data port on a D-Star radio is transmitted interstitially - no packetizing, no error correction. It took more than a decade, but Icom finally improved the data capability of D-Star to be able to optionally use almost the entire

4800 bps datastream for data, implemented as DV Fast Data mode[5].

- It's early days for the Icom IC-905 (debuted in mid-2023) but Icom offering a production radio unit that implements 2.x, 5.x, and 10.x GHz radios, a fully remoted radio (all radio hardware is located near the antennas), and inclusion of (analog) Amateur Television capability is a platform for future product variants that could become even more popular than the IC-905.

- Unique among large Amateur Radio vendors such as Yaesu, Kenwood, and Alinco, and especially compared to Amateur Radio vendors based in China, Icom gives the impression that as a company, it truly cares about the Amateur Radio market despite Amateur Radio being a minor part of its total market. Developing the IC-905 (and the IC-9700 before it, and continuing that product) as a new class of Amateur Radio product in this era speaks volumes about Icom's ongoing commitment to the Amateur Radio market[6].

- While it's a "soft" competency… but a very substantive competency, Icom's promotion and marketing is consistent and competent. In the Amateur Radio market, in marked contrast to some of its competitors, Icom has continued to "show up" at major Amateur Radio conferences. As part of its marketing strategy, Icom has pivoted from multi-page advertisements in declining magazines to sponsorships of numerous new media productions (podcasts, YouTube channels).

- Icom's Amateur Radio customer base is unusually passionate (rabidly so, at times), and technically capable of creating new capabilities for Icom products. One example was creating early linking of D-Star repeaters via Internet (initially, Icom only supported linking via 10 GHz point-to-point microwave units and ISDN telephony). Notably, D-Star users created an independent D-Star network - D-Star ircDDB and an open source "Hotspot" called MMDVM[7].

- In my opinion, Icom stating "… via Narrowband RF Technology…" identifies a key, defensible core competency[8]. Dividing much of the available spectrum below 1 GHz into narrowband radio channels is a legacy of previous generations of radio technology that will take decades to overcome. Many other manufacturers of radio equipment accept this limitation and don't attempt to innovate other than tinkering at the margins. But as Amateur Radio and especially Software Defined Radio technology has demonstrated, there is ample innovation occurring despite the restrictions imposed by narrowband channels:

    - VARA FM achieves up to 25 kbps by leveraging OFDM technology in audio; the previous assumed maximum for narrowband channels is ~9600 bps.

    - Channel aggregation combines multiple narrowband channels to offer the same advantages of speed of a wider (contiguous) channel. This is trivial for Software Defined Radios.

    - Adaptive modulations use techniques such as varying modulation types, Forward Error Correction (FEC), and Automatic Repeat Request (ARQ) when needed, and don't use them when not needed.

That's my opinion of what Icom is doing right (well), at the moment.

…

What could Icom be doing - better?

- Purely in the "wouldn't it be cool if…" category, perhaps Icom could work with Iridium to make the IC-SAT100 (mostly, Iridium airtime) affordable for casual use by Amateur Radio Operators worldwide. Equipping a wide variety, and widely dispersed cadre of Amateur Radio Operators with "works anywhere you can see the sky" IC-SAT100s could pay dividends.

- The current "low end" D-Star radio is the ID-5100A that is $450+. Thus there is a big hole in Icom's product line for a lower-cost D-Star mobile, especially one that supports DV Fast Data mode. Perhaps Icom could develop a minimalist DV Fast Data radio - no (expensive) CODEC, no front panel, just a black box with power, antenna, and USB for control and data. If Icom does create a new D-Star mobile radio (equivalent to the discontinued ID-880H), hopefully it will incorporate DV Fast Data mode.

- D-Star data (interstitial, and DV Fast Data) could be supported better in applications. From my readings, the primary application that supports D-Star data is D-RATS. (There's a lot of good information about D-RATS to digest on the D-Rats mailing list files section - https://groups.io/g/d-rats/files.)

- In high-end radios that include VHF and UHF, such as the IC-905… it's past time that Icom incorporates Digital Mobile Radio (DMR) compatibility on par with D-Star. Making DMR more usable by Amateur Radio is something that Icom could definitely improve on the DMR experience. Yes, DMR wasn't designed for Amateur Radio (no provision for interstitial callsigns like D-Star, etc.) but DMR is effectively now the default Digital Voice mode in Amateur Radio, supplanting D-Star.[9] Yes, Motorola successfully sued Hytera about infringing on Motorola patents, but Hytera was marketing units for commercial, not Amateur Radio use. DMR is an open standard, and it seems that sticking to the DMR standard would be "safe".

- Icom's Digital Data (DD) mode - 128 kbps in a 100 kHz channel on 1240-1300 MHz is unchanged for ~ two decades now since the debut of the ID-1. It seems like Icom could have improved on DD mode to take advantage of improved technology (a fully functional Linux computer with a full TCP/IP stack is $35 retail), with Forward Error Correction, etc. Perhaps the IC-905 could have implemented faster data modes on 2.x GHz and 5.x GHz. Yes, there are ample 2.4 GHz and 5 GHz "data" systems available to Amateur Radio, but there's a key difference with an Amateur Radio unit such as teh IC-905 - *2 watts transmit power on 2.x and 5.x GHz*, and the ability to run narrow channels for greater power spectral density. Perhaps the IC-905 could have included a DD mode on 420-450 MHz for even better data capabilities with 10 watts transmit power and the same 100 kHz channel.[10]

- Icom could also be the first, or second vendor to support the open source FreeDV mode as standard *in the radio*.[11] FreeDV is most often used on HF, but there's nothing to prevent it from being implemented on VHF / UHF, especially in an all-mode VHF / UHF radio.

- Similarly, M17 Project has been hoping for a radio vendor to have enough courage to implement M17's protocols, etc. It seems like the IC-905 is designed to appeal to experimenters, and the more "interesting experimental" modes that radios such as the IC-905 can make available, the more appealing the IC-905 would be.

- It's something of an anachronism, but Icom could restore the semi-standardized "data jack" (AKA "9600 port") to its radios for data communications using external modems. It's surprising that Icom didn't include a "data jack" in the Icom IC-9700, or even on the IC-905. The reason for including a data jack is that with a suitable modem such as the Masters Communications DRA-50, VARA FM software can achieve up to

25 kbps data speeds in a standard 25 kHz VHF / UHF channel, far in excess of D-Star DV Fast Data's speed of ~4800 bps and even the (problematic, in practice) 9600 bps Packet Radio speeds.

- Perhaps Icom could update its now severely dated D-Star literature. Some of these PDFs date back to 2003.

Lastly, I applaud Icom for not only making such introspective thoughts for their short term planning publicly available, but also their significant attention to the Amateur Radio market in their planning, despite it being a minor part of their overall business.

Leave a comment

Share

Update on my Neil's Night Progress

By Steve Stroh N8GNJ

For background on Neil's Night, see the prior discussion in Zero Retries:
Part 1, Part 2, and Part 3.

Family circumstances have disrupted my plans to develop my personal Neil's Night system for attempting to receive Earth Moon Earth (EME) transmissions on the evening of July 20th, the anniversary of humanity's first steps on the Moon. I will resume my Neil's Night thought experiment in either Zero Retries 0106 or 0107 in early July. In the meantime, I recommend this series of articles by Paul Bock K4MSG:

EME on a Budget - Part 1, Part 2, Part 3

K4MSG also offers a great summarization of EME in a presentation - Beginner's Guide to Small-station EME.

K4MSG answered a lot of my newbie questions about "small scale" EME such as I envisioned for Neil's Night.

In particular, K4MSG offered these observations:

> **EME Operational Characteristics and Lunar Availability**
>
> It is important that anyone interested in EME understand the "operational characteristics" of using the Moon as a reflector for two-way communications. Below is a short list of the major concerns.
>
> 1. BOTH STATIONS MUST "SEE" THE MOON. This may seem like a superfluous statement but it bears repeating that the Moon *MUST* be above the horizon at both ends of an EME QSO.
> 2. The Moon's position changes daily and the rising & setting times advance day by day by about a half-hour to an hour depending on the time of the month. This will impact potential operating times and depending on personal schedule may limit one's "on-air" availability.
> 3. Due to the Moon's rotational schedule relative to sources of celestial noise and the Sun the Moon is only available and useful for EME operation for about 20 days per month.

Thus, perhaps choosing to attempt to receive EME signals on July 20th annually might not be an suitable date.

I also confirmed with My Very Bright Friend (mentioned in Neil's Night Part 1) that receive-only JT65 works fine. (I wasn't sure if JT65 "required" a transmit capability.)

Leave a comment

Share Zero Retries

ZR > BEACON

Short mentions of Zero Retries Interesting items.

Ofcom - Updating the amateur radio licensing framework - An approach for today and tomorrow's radio amateurs

Ofcom is the UK equivalent of the US Federal Communications Commission (FCC). To me, the "attention to Amateur Radio" that led to this project and document is encouraging. Not that I have any qualification to judge, but Ofcom's proposed changes seem to be reasonable. In particular, I found this section of the document to be interesting:

> **Some additional privileges beyond the standard licence terms are available on a temporary basis through a Notice of Variation to the licence**
>
> 2.20 The amateur radio licence sets out the restrictions within which licensees must operate. However, we may issue some specific additional permissions, which relax one or more of these licence restrictions, for a set period of time. This type of authorisation is called a Notice of Variation ('NoV'). An NoV can authorise an additional technical parameter, such as the use of a frequency band not listed in the licence. Alternatively, an NoV might authorise the use of an alternative call sign.
>
> 2.21 We issue a number of different NoVs on request. We have a set list of these NoVs that we allow; many of these have been in place for a significant number of years. However, administering NoVs places an administration burden on licensees and Ofcom. Some NoVs entail no more than simply downloading a form from a website, while others require the applicant to provide complex technical information or meet certain qualifying criteria for Ofcom's approval.

Note the conversational tone in explaining the proposed changes - that was very refreshing compared to the dense legalese that the FCC uses for such documents.

As I (think) I understand NoV, it functions much like the FCC's Special Temporary Authority (STA) authorization, but seemingly far more streamlined - fill out a form, often online and often, permission granted (for a limited time).

Wow… that would be cool to implement here in the US!

My thanks to Amateur Radio Daily for mentioning this.

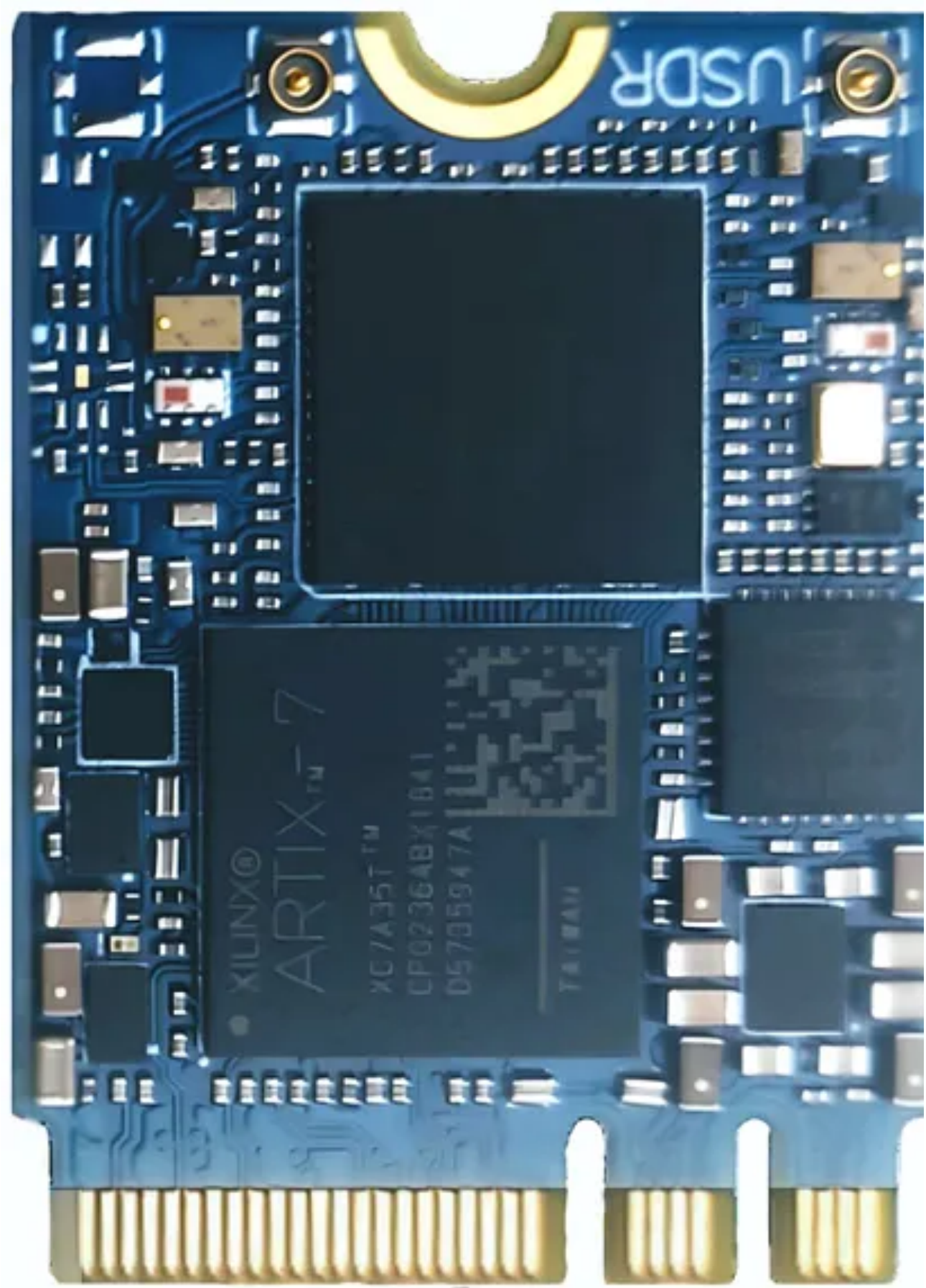
Exploring the Experimental Firmware for Quansheng UV K5 Radio

This was an interesting, if familiar[12], discussion of "unlocking" the transmit / receive capabilities of this inexpensive new radio well outside typical frequency ranges for a portable radio - 18 - 660 MHz and 840-1300 MHz.

But at second glance, it gets a bit interesting to theoretically[13] be able to transmit and receive some of the more uncommon Amateur Radio VHF / UHF bands such as 28.0 - 29.7 MHz (10 meters), 50 - 54 MHz (6 meters), 222 - 225 MHz (1.25 meters), etc.

But what I really found intriguing was the photo of the datasheet for the BK4819 radio chipset had this mention - *FSK data modem*. Hmmm… able to hack the firmware of the radio… maybe turn on that FSK data modem?

Perhaps this radio is hackable enough to implement M17 - OpenRTX has done so for other portable radios.


USDR
XILINX®
ARTIX™-7
XC7A35T™
TAIWAN

> Image courtesy of Wavelet Lab / Crowd Supply

uSDR - A tiny, single-sided M.2 SDR board that you can operate easily using your web browser

uSDR is another interesting crowdfunded Software Defined Radio project offered via Crowd Supply that's now in the funding stage with more than one month to go (22% funded).

> uSDR is an embedded software-defined radio (SDR) board that is optimized for ease of use and collaboration. It incorporates WebUSB technology, which enables full functionality in the Chrome browser—under Linux, Windows, MacOS, and Android—without requiring specific drivers or software.

uSDR is yet another intriguing Software Defined Transceiver, and the idea of the *radio* providing its interface via web browser is interesting. But, it's $299, requires some additional hardware to be usable, and it's still at the funding / pre-availability stage, so I'll remain an observer.

Leave a comment

Share Zero Retries

Join the *Fun* on Amateur Radio

If you're not yet licensed as an Amateur Radio Operator, and would like to join the fun by *literally having a license to experiment with radio technology*, check out
Join the Fun on Amateur Radio for some pointers.

Zero Retries Frequently Asked Questions (FAQs) — In development 2023-02.

Closing the Channel

In its mission to highlight technological innovation in Amateur Radio, promote Amateur Radio to techies as a literal license to experiment with radio technology, and make Amateur Radio more relevant to society in the 2020s and beyond, Zero Retries is published via email and web, and is available to everyone at no cost. Zero Retries is proud *not to participate* in the Amateur Radio Publishing Industrial Complex, which hides Amateur Radio content behind paywalls.

My ongoing ***Thanks*** to:

- Tina Stroh KD7WSF for, well, *everything!*
- **Pseudostaffers** that write about about "Zero Retries Interesting" items on their blogs that I don't spot:
  - Dan Romanchik KB6NU
  - Jeff Davis KE9V
- **Newsletters** that regularly feature Zero Retries Interesting content:
  - Amateur Radio Weekly by Cale Mooth K4HCK is a weekly anthology of links to interesting Amateur Radio stories.
  - Experimental Radio News by Bennet Z. Kobb AK4AV discusses (in detail) Experimental (Part 5) licenses issued by the US FCC.
  - TAPR Packet Status Register has been published continuously since 1982.
  - Other Substack Amateur Radio newsletters recommended by Zero Retries.
- **YouTube channels** that regularly feature Zero Retries Interesting content:
  - HB9BLA Wireless by Andreas Spiess HB9BLA
  - KM6LYW Radio by Craig Lamparter KM6LYW (home of the DigiPi project)
  - Modern Ham by Billy Penley KN4MKB
  - Tech Minds by Matthew Miller M0DQW
- The Substack email publishing platform makes Zero Retries possible. I recommend it for publishing newsletters.

If you're reading this issue on the web and you'd like to see Zero Retries in your email Inbox every Friday afternoon, just click below to join ~~100~~ ~~200~~ ~~300~~ ~~400~~ *500* ~~600~~ ~~700~~ *800+* other readers:

Subscribe now

Please tell your friends and co-conspirators about Zero Retries — just click:

Share Zero Retries

Offering **feedback or comments** for Zero Retries is equally easy — just click:

Leave a comment

If you're a fellow smart person that uses **RSS**, there *is* an **RSS feed for Zero Retries**.

Zero Retries (N8GNJ) is on Mastodon — n8gnj@mastodon.radio — just click:

Zero Retries / N8GNJ on Mastodon

Email issues of Zero Retries are "instrumented" by Substack to gather basic statistics about opens, clicking links, etc.

More bits from Steve Stroh N8GNJ:

- SuperPacket blog — *Discussing new generations of Amateur Radio Data Communications — beyond Packet Radio (a precursor to Zero Retries)*
- N8GNJ blog — *Amateur Radio Station N8GNJ and the mad science experiments at N8GNJ Labs — Bellingham, Washington, USA*

Thanks for reading!
Steve Stroh N8GNJ / WRPS598 (He / Him / His)
These bits were handcrafted (by a mere human, not an Artificial Intelligence bot) in beautiful Bellingham (The City of Subdued Excitement), Washington, USA.

2023-06-23

If you'd like to reuse an article in this issue, for example for club or other newsletters, just ask. Please provide credit for the content to me and any other authors.

All excerpts from other authors or organizations, including images, are intended to be fair use.

Portions Copyright © 2021, 2022, and 2023 by Steven K. Stroh.

Blanket permission granted for TAPR to use any Steve Stroh content for the TAPR Packet Status Register (PSR) newsletter (I *owe* them from *way* back).

1

SuperRadio is solely my invented nickname because the IC-905 simultaneously debuted a number of new categories in (mass production units) Amateur Radio capabilities.

2

… other than my unreserved, ongoing admiration for FlexRadio's approach of hardware in service to the software - true Software Defined Radio.

3

Another notable aspect of the ID-1 was that it was the first production Amateur Radio (that I'm aware of) that incorporated Ethernet connectivity as a standard feature.

4

In marked contrast to DMR where data is "in the spec" but implementations vary widely, and Yaesu's System Fusion data capability has been crippled to only support transmission of images, not data.

5

DV Fast Data mode is *barely* supported (again, my opinion), but it's finally available in selected radios, and it's backwards compatible with all of Icom's D-Star (DV) repeaters.

6

Matched only by (yet again, in my opinion) FlexRadio Systems.

7

As the acronym indicates (MM is Multi Mode), MMDVM was created in part to support D-Star, but also other digital modes, especially digital voice modes.

8

Similar in scope to FlexRadio Systems specializing in High Frequency (HF) radio technology when it has been overlooked and under-invested by other manufacturers of radio technology systems.

9

Yes, in certain areas, D-Star systems are widespread. Also, in my observations, Yaesu's System Fusion is not nearly as widely used as D-Star, let alone DMR.

10

Yes, in the US, there is currently an inane limitation of 56,000 "symbols per second" on 420-450 MHz… but that's a limitation in the US, not other countries. "DD on 440" could be trialed in other countries and when it's well proven, perhaps the US regulations could be updated.

11

In previous versions of SmartSDR, FlexRadio had optional support for FreeDV.

12

… and more than a bit dysfunctional that radio vendors like this can openly flout the legalities of FCC's Type Acceptance regulations with essentially no consequences (consequences, *smonsequences*; if sanctioned, just change the company / brand name and resume sales). Meanwhile US Amateur Radio regulations stifle innovations like retarding New Packet Radio to not exceed 56,000 "symbols per second" in the 420-450 MHz band in a 100 kHz channel, when it's native data rate (legal outside the US) is *500 kbps*. Sigh…

13

I'm skeptical - I don't believe it will actually work, but… *maybe*… if you use a suitable antenna…